Claims

What is claimed is:

1. A spacer block for positioning between a first and second high-voltage conductor in an electric machine, said spacer block comprising:

a main body comprising a substantially rectangular block constructed of an insulating material, said main body having a principal width W for separating said first and second high-voltage electrical conductor by a distance of substantially W;

an exposed surface along said principal width of said main body, extending from said first high-voltage conductor to said second high-voltage conductor; and

a protruding portion protruding from said main body and elongating said exposed surface to form a creepage path between said first and second high-voltage electrical conductor that is greater in length than said principal width W of said spacer block.

2. The spacer block of claim 1 wherein said protruding portion protrudes substantially symmetrically from the middle of said principal width of said spacer block.

3. The spacer block of claim 2 wherein said protruding portion comprises a substantially rectangular step-up region.

4. The spacer block of claim 3 wherein said creepage path over said exposed surface comprises a path over a first substantially planar surface extending substantially perpendicularly from said first high-voltage conductor; a second substantially planar surface extending substantially perpendicularly from said first surface, a third substantially planar surface extending substantially perpendicularly from said second surface, a fourth substantially planar surface extending substantially perpendicularly from said third surface, and a fifth substantially planar surface extending substantially perpendicularly from said fourth surface.

5. The spacer block of claim 4 wherein said exposed surface includes corners and edges formed at intersections of said substantially planar surfaces and wherein said corners and edges are rounded to improve the electrical performance of said spacer block.

6. The spacer block of claim 5 wherein said exposed surface of said spacer block forms a creepage path approximately 5 times the principal width W of said spacer block.

7. A support structure for supporting at least a first and second high-voltage conductor in an electric machine, said support structure comprising:

a brace constructed of an electrical-insulation material and configured to be rigidly mounted to said electric machine to mechanically support said first and

second high-voltage conductor, said brace having a support surface on which said first and second high-voltage conductor are positioned; and

a spacer block having a principal width W and constructed of an electrical-insulation material, wherein said spacer block is configured to be mounted between said first and second high-voltage conductors for spacing said first and second high-voltage conductor apart by a distance of substantially W;

wherein said spacer block includes a protruding portion comprising a substantially rectangular protrusion protruding from said spacer block to form an elongated surface over said spacer block between said first and second high-voltage conductor; and

and a creepage path formed over a substantially shortest path over said elongated surface from said first high-voltage conductor to said second high-voltage conductor, said creepage path having a length L that is greater than the principal width W of said spacer block.

8. The support structure claim 7 wherein said protruding portion protrudes substantially symmetrically from the midpoint of said principal width of said spacer block.

9. The support structure of claim 7 wherein said protruding portion comprises a substantially rectangular step-up region.

10. The support structure of claim 9 wherein said creepage path over said elongate surface comprises a path over a first substantially planar surface extending substantially perpendicularly from said first high-voltage conductor; a second substantially planar surface extending substantially perpendicularly from said first surface, a third substantially planar surface extending substantially perpendicularly from said second surface, a fourth substantially planar surface extending substantially perpendicularly from said third surface, and a fifth substantially planar surface extending substantially perpendicularly from said fourth surface.

11. The support structure of claim 10 wherein said elongate surface includes corners and edges formed at intersections of said substantially planar surfaces and wherein said corners and edges are rounded to improve the electrical performance of said spacer block.

12. The support structure of claim 9 wherein said elongated surface of said spacer block forms a creepage path approximately 5 times the principal width W of said spacer block.

13. A method of mechanically supporting and spacing apart a first and second high-voltage conductor, comprising the steps of:

positioning an insulating spacer block between said first and second high-voltage conductor to space apart said first and second high-voltage conductor by

a distance W substantially equal to a principal width of said spacer block, wherein said spacer block comprises a main body having a substantially rectangular shape and at least one protruding portion for increasing a creepage path between said first and second high-voltage conductor to a length L that is greater than the principal width W of the spacer block.

14. The method of claim 13 wherein said protruding portion is formed substantially symmetrically about the center of said width of said spacer block.

15. The method of claim 13 wherein said creepage path comprises a path over a first substantially planar surface extending substantially perpendicularly from said first high-voltage conductor; a second substantially planar surface extending substantially perpendicularly from said first surface, a third substantially planar surface extending substantially perpendicularly from said second surface, a fourth substantially planar surface extending substantially perpendicularly from said third surface, and a fifth substantially planar surface extending substantially perpendicularly from said fourth surface.

16. The method of claim 15 wherein said creepage path includes corners and edges formed at intersections of said substantially planar surfaces, wherein said corners and edges are rounded to improve the electrical performance of said spacer block.

17. The method of claim 14 wherein said creepage path has a lengh L of approximately 5 times said principal width W of said spacer block.